

### **REMARKS**

Claims 1-3, 10-12, 15-16, 19-28 and new claims 29-36 are pending. The support for the claim amendments and new claims in the published application are as follows: Claim 1: (grammatical); new claims 29, 33: ([0071]); claims 30, 34: ([0100]); claims 31, 35: ([0038]); and claims 32, 36: ([0087]). No new matter has been added.

**Claims 1-3, 10-12, 15, 16, 19-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Japanese Patent 51-41102 (newly cited, of record), Nichol, Soviet Union 1074719 and UK 2,213,406 (newly cited).** (Office Action, Page 2)

In summary, Claims 1 and 10 both comprise the following characteristics among others:

- (i) A hot melt adhesive is used in a melted state to coat a surface of a substrate.
- (ii) A wood board is used as the substrate.
- (iii) A coating equipment, which includes plural applicator roller stages which form an adhesive layer by laminating plural coatings of a hot melt adhesive, is used.
- (iv) At least one applicator roller is rotated at a circumferential speed at least 20% slower or at least 20% faster than the predetermined speed at which the substrate is conveyed to cause it to slip.
- (v) At least one applicator roller has a surface made of a material, which reduces slipping.
- (vi) The hot melt adhesive is supplied from a pool of the hot melt adhesive existing in a valley formed by the applicator roller and a metering roller via an interface of the rollers.
- (vii) An adhesive layer is formed on substantially the entire upper surface of the substrate with the hot melt adhesive.

Furthermore, Claims 1 and 10 comprise the following characteristics independently.

- (viii) The hot melt adhesive is a urethane reactive hot melt adhesive. (Claim 1)
- (ix) The applicator rollers are rotated in the direction, to which the substrate is moved on a conveyor. (Claim 1)
- (x) The upper surface of the substrate is contacted from above with the applicator rollers. (Claim 1)
- (xi) The hot melt adhesive melts in a temperature range of 100 to 130°C. (Claim 1)

- (xii) A laminate such as a film and paper is provided on an adhesive layer provided on the substrate in order to obtain a laminated object. (Claim 10)

Regarding cited references:

- The **admitted prior art** fails to teach or suggest the characteristics (iii), (iv), (v), and (vi), (xi) of Claims 1 and 10.
- **JP 51-41102** fails to teach or suggest the characteristics (i), (vi), (v), (xi) and (xii).
- **USP 3,313,18 (Nichol)** fails to teach or suggest the characteristics (iii), (vi), (v), (vii), (viii), (x), (xi) and (xii).
- **Soviet Union 1074719** fails to teach or suggest the characteristics (i), (iii), (iv), (v), (vii), (viii), (xi) and (xii).
- **UK 2213406** fails to teach or suggest the characteristics (ii), (iii), (iv), (vi), (viii), (x) and (xi).

As shown above, the cited references are structurally different from the claimed invention. The characteristics of Claims 1 to 3, 10 to 12, 15, 16 and 19 to 26 are not disclosed in each reference.

Further, there is no sufficient motivation to combine the references, as the cited devices have vastly different uses and purposes, as explained below. A person having ordinary skill in the art does not modify five or six cited references or combine reference teachings to achieve the present invention.

Regarding admitted prior art

- As described above, (iii), (iv), (v), and (vi), (xi) are not disclosed in the admitted prior art.

Regarding JP 51-41102

- As described above, JP 51-41102 fails to teach or suggest the characteristics (i), (vi), (v), (xi) and (xii).

The rejection described that JP 51-41102 suggested that it was known at the time the invention was made to coat a plate-like object wherein the device included a plurality of roller coating stations to coat the plate like object. However, JP 51-41102 discloses a roller coating device for forming a board-like object on which coating surface is formed. That is, coating of JP

51-41102 is conducted *not for adhering a substrate to a sheet, but for forming a surface coating of the board-like object.*

Furthermore, there is no description that hot melt adhesive is used in JP 51-41102. A coating liquid (solvent-base or aqueous-base), which has moderate quick drying property, is coated on the surface of the object in JP 51-41102.

The coating liquid (solvent-base or aqueous-base) of JP 51-41102 *has low viscosity, and a leveling property thereof is good. Therefore, smooth surface can be formed by one coating.* Although there is a description that "a coating layer is coated on another coating layer before the coated another coating layer has been dried" in the left column on page 1 of JP 51-41102, it seems that the two coatings are conducted to form a single thick surface coating with the coating liquid.

*On the other hand, a hot melt adhesive is used in the claimed invention. Pin holes,* which are defects generated in the coated surface, tend to be generated when a hot melt adhesive is used. The reason is that *a hot melt adhesive has high viscosity* as compared with a solvent-base or aqueous-base coating liquid, and therefore, it is difficult to fill such pin holes according to a leveraging property of a hot melt adhesive itself.

JP 51-41102 discloses an over-running mechanism in order to *prevent the velocity difference between the rotating speed of application rollers* and a transfer speed of the substrate, that is, to prevent an occurrence of a slip. In general, it is necessary to adjust said speeds when a uniform coating is formed with a coating liquid as used in JP 5141102. If said speeds are different from each other, a uniform coating surface cannot be generated. Accordingly, a person skilled in the art would not expect that a hot-melt adhesive could be coated very smoothly with applicator rollers of JP 51-41102 by varying the speed of the rollers. *In general, the method for obtaining a smooth surface is different between the case where a hot-melt adhesive is used and a case where a coating liquid (solvent-base or aqueous-base liquid, which is different from a hot melt adhesive) is used.* When it is necessary to improve a surface property of an adhesive layer, a person skilled in the art is not motivated to combine references where a hot-melt adhesive is used such as USP 3,313,218 or the like and references where a coating liquid (solvent-base or aqueous- base liquid) such as JP 51-41102, where plural application roller are disclosed, is used.

Regarding UK 2213406

The rejection described on page 5 of the Office Action that UK 2213406 suggests that one skilled in the art of coating a substrate with a hot melt adhesive would have associated a rubber sleeve onto the coating roller in order to better control the transfer of the adhesive upon the substrate being coated. The rejection further described that it would have been obvious to utilize a rubber sleeve about the exterior of the adhesive coating roller in order to minimize hot melt adhesive built up on the coating roller, as well as to provide for the better transfer of the adhesive to the substrate being coated as allegedly suggested by UK 2213406.

In the description, "a rubber sleeve" seems to be used as "a surface of an applicator roller wherein the surface is made of a material which reduces slipping" disclosed in Claim 1. As described above, when a *coating liquid (solvent-base or aqueous-base liquid, which is different form a hot melt adhesive) is coated on a substrate uniformly, it is necessary to control the rotating speed of an application roller and a transfer speed of the substrate so that they are identical in order to prevent an occurrence of a slip.* The reason is that uniform coating surface (undulate surface) cannot be generated by such a coating liquid when a slip is caused.

Although a hot melt adhesive is described on page 10, line 22 of -UK 2213406, as well as a coating liquid (solvent-base or aqueous-base), there is no description that the rotating speed of an application roller or the like is changed so that it differs from a transfer speed of the substrate. Accordingly, it is suggested latently in UK 2213406 that the *rotating speed of an application roller is identical with the transfer speed of the substrate and a slip is not caused*, although a hot melt adhesive is disclosed in UK 2213406.

Furthermore, unlike the present invention, UK 2213406 discloses a method wherein an adhesive is *coated on a soft web or the like, and then, the coated web is applied to a solid substrate* such as a card or board sheet. Such a web is apparently different from a wooden substrate used in the claimed invention,

Furthermore, in UK 2213406, a coating liquid (solvent-base or aqueous-base) is supplied from a downward direction as shown in the figure.

Simply put, such different technical characteristics of UK 2213406 do not provide a person skilled in the art sufficient motivation to combine UK 2213406 and the other references.

Regarding Soviet Union 1074719

Soviet Union 1074719 fails to teach or suggest (i), (iii), (iv), (v), (vii), (viii), (xi) and (xii). *Soviet Union 1074719 fails to disclose a hot melt adhesive and the speed of a coating roller, among other characteristics.* As described above, a person skilled in the art is *not motivated to combine a reference where a hot-melt adhesive is used and a reference where a coating liquid (solvent-base or aqueous-base liquid) is used* in order to improve the surface properties thereof.

Regarding USP No. 3313218

USP 3,313,218 (Nichol) fails to teach or suggest (vi), (v), (vii), (viii), (x), (xi) and (xii). The rejection described on page 4 of the Office Action that Nichol suggested that one would have operated the roller at a speed differential of about 25% in order to ensure proper transfer of adhesive from a coating roller.

As shown in Nichol, a hot-melt glue is partially coated on a wax-covered paper with short rollers in order to join paper surfaces to form a container. *Nichol fails to disclose coating an adhesive on to a wooden substrate.*

The purpose of the present invention and that of Nichol are different from each other. Although the purpose of Nichol is to ensure proper transfer of adhesive from a coating roller, the *purpose of the present invention is to prevent roughness of surface (fuzzy surface of a adhesive layer) which occurs when a hot melt adhesive is coated on a wooden substrate*, as those described in the present specification. That is, the present invention intends to provide an extremely smooth surface of a hot melt adhesive layer provided on a *wooden substrate*. A person skilled in the art is technically not motivated to use Nichol to improve a surface property of a hot melt adhesive provided on a wooden substrate.

Conclusion

As described above, there is insufficient technical and logical motivation for combining vastly different references for a person skilled in the art. Particularly, references which discloses the use of a hot-melt adhesive and references which do not disclose the use of a hot-melt adhesive are not logically combinable.

Regarding Claims 2 to 3, 11 to 12, 15, 16 and 19 to 26 of the claimed invention, they depend on Claim 1 or 10. Those dependent claims are believed to be allowable because Claims 1 and 10 are believed to be allowable for the reasons mentioned above.

It is respectfully requested that the rejection be reconsidered and withdrawn.

**Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as set forth above in paragraph 2 further taken with Nagata.** (Office Action, Page 7)

Claim 16 is believed to be allowable, because Claim 1 is believed to be allowable for the reasons mentioned above. Furthermore, unlike Claim 16 of the invention, Nagata fails to teach or suggest the characteristics (i), (ii), (iii), (iv), (v), (vi), (vii), (ix), (x), and (xi). In addition, the reactive hot-melt adhesive composition of Nagata is applied at low temperature of 70°C or more and less than 100°C as described in column 3, lines 23 to 27 of Nagata.

It is respectfully requested that the rejection be reconsidered and withdrawn.

**Claims 12, 19, 20, 23, 24, 27, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as set forth above in paragraph 2 further taken with Japanese Patent 58-28376 (newly cited).** (Office Action, Page 9)

These claims are also believed to be allowable, because Claims 1 and 10 are believed to be allowable for the reasons mentioned above. Furthermore, JP 58-28376 fails to teach or suggest the characteristics (i), (iii), (iv), (v), (vi), (viii), (ix) and (xi). In addition, in JP 58-28376, an adhesive is *first coated on a thin sheet*. Then, the coated sheet is provided on a thin wooden substrate to form a wood substrate coated with the sheet which is *usable for packing a lunch* or the like. This is different that what is now claimed.

It is respectfully requested that the rejection be reconsidered and withdrawn.

In view of the above amendment, applicant believes the pending application is in condition for allowance.

The Director is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 04-1105.

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Respectfully submitted,

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